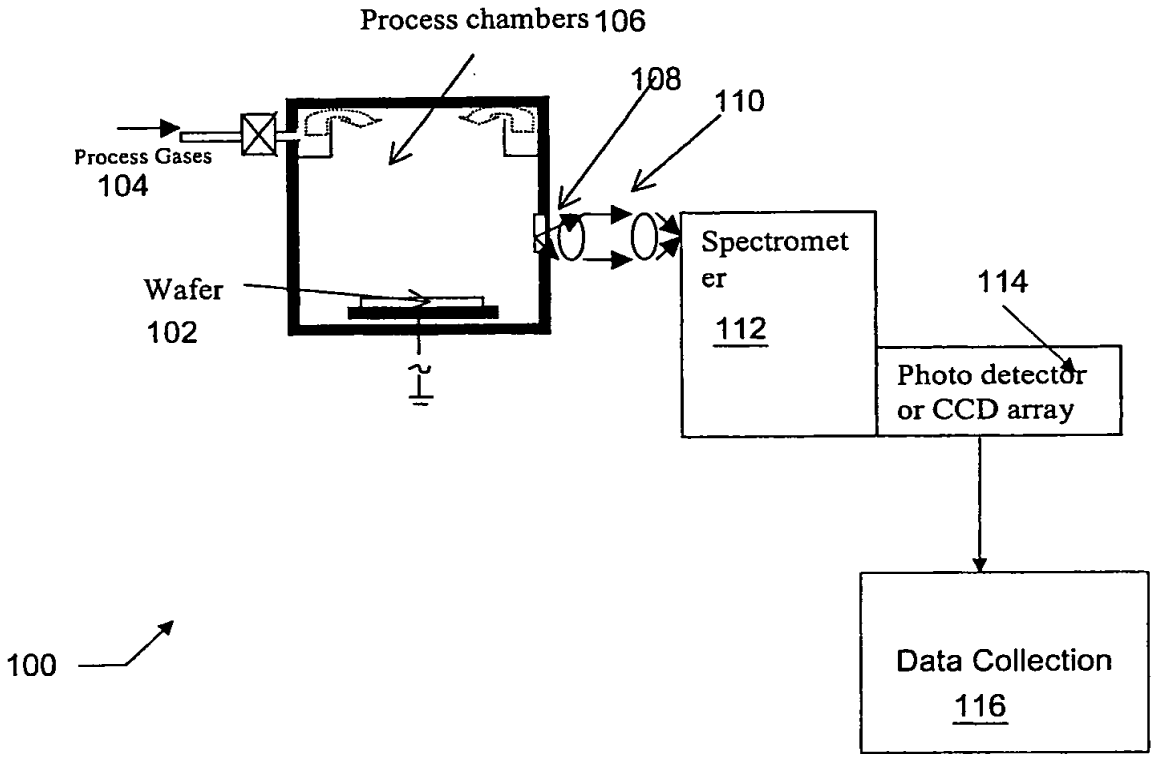
Process chambers 106
108
110
Process Gases
104
Wafer
102
Spectrometer
112
114
Photo detector or CCD array
100
Data Collection
116

FIG. 1

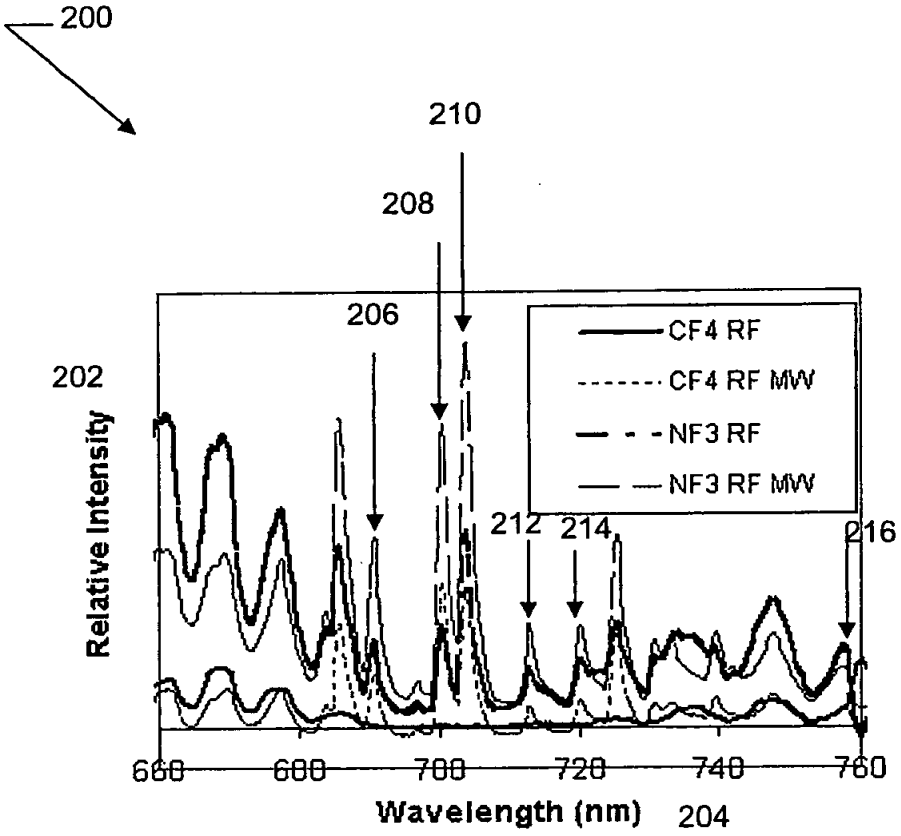
200
210
208
206
202
CF4 RF
CF4 RF MW
NF3 RF
NF3 RF MW
212
214
216
Relative Intensity
600
680
700
720
740
760
Wavelength (nm)
204

FIG. 2

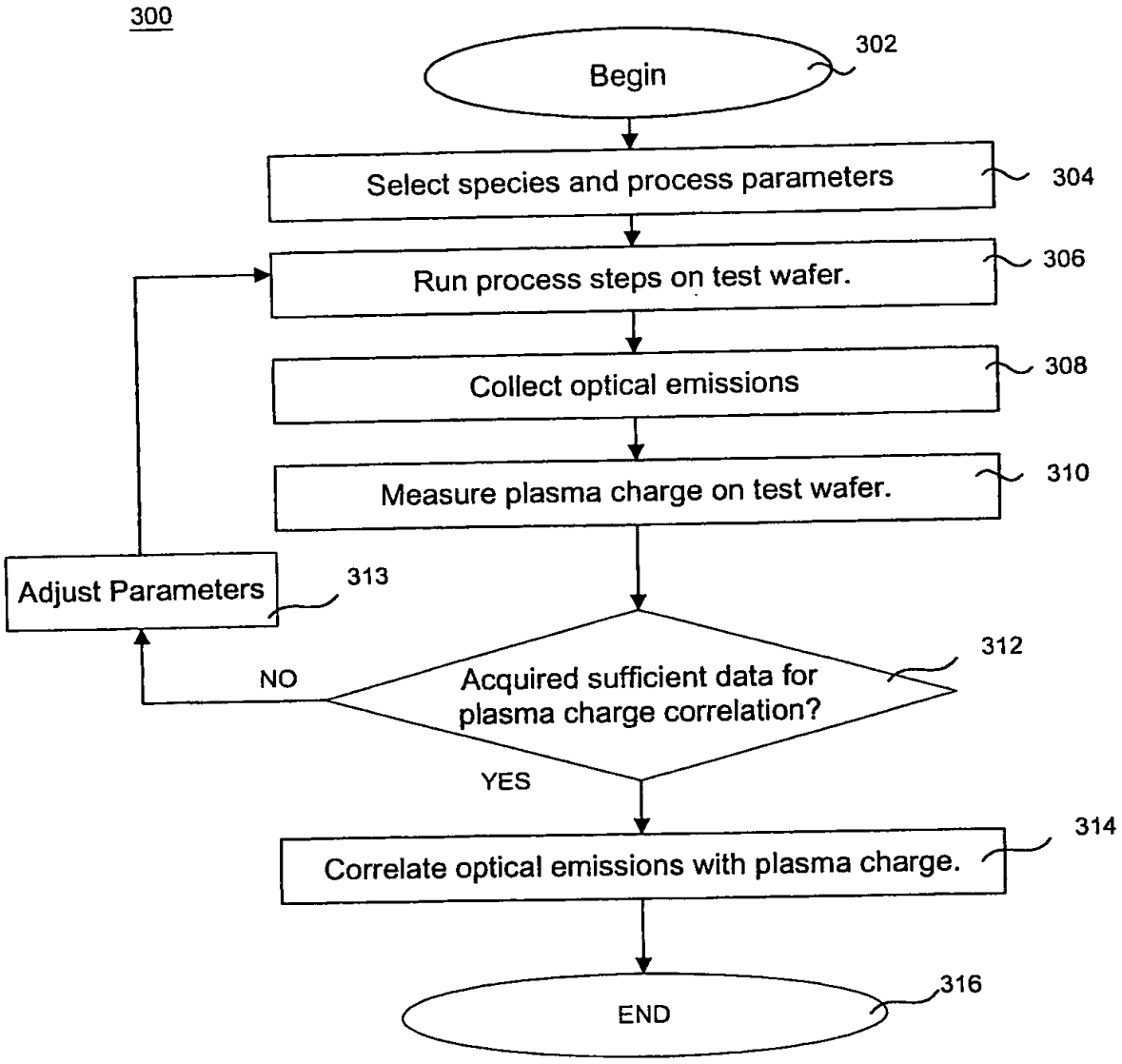
300
Begin
302
Select species and process parameters
304
Run process steps on test wafer.
306
Collect optical emissions
308
Measure plasma charge on test wafer.
310
Adjust Parameters
313
NO
Acquired sufficient data for plasma charge correlation?
312
YES
Correlate optical emissions with plasma charge.
314
END
316

FIG.3

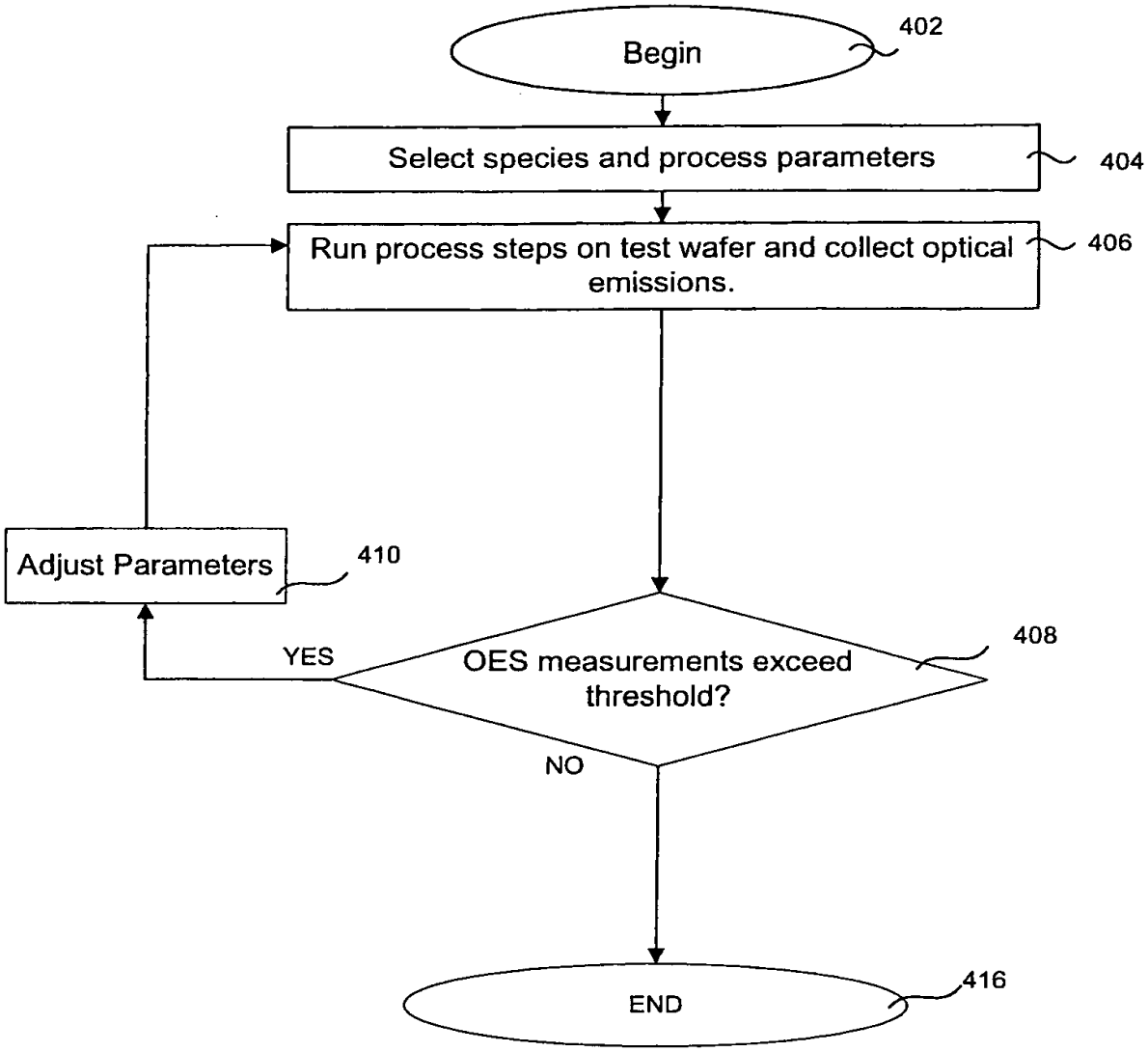
Begin
402
Select species and process parameters
404
Run process steps on test wafer and collect optical emissions.
406
OES measurements exceed threshold?
408
YES
NO
Adjust Parameters
410
END
416

FIG. 4

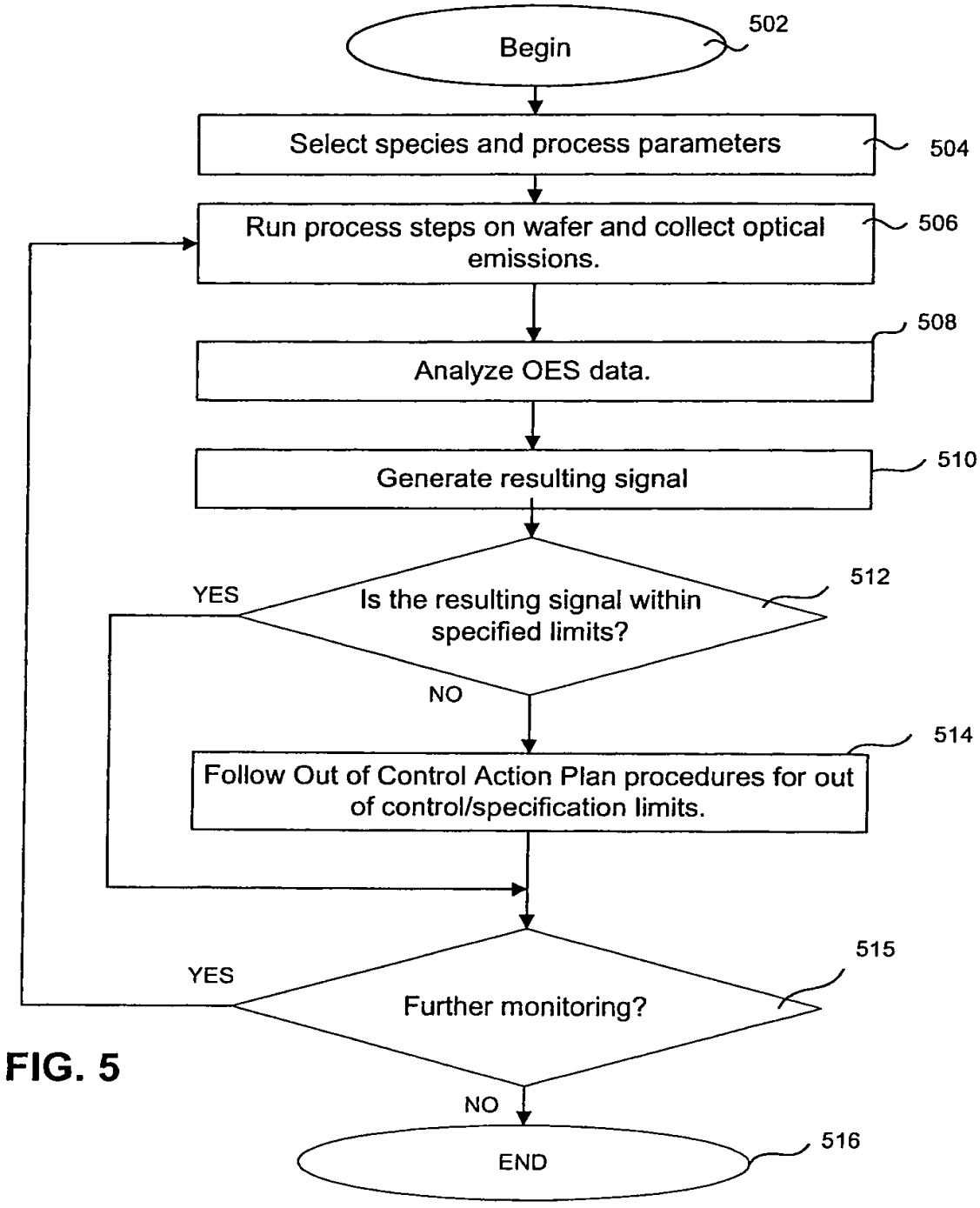
Begin
502
Select species and process parameters
504
Run process steps on wafer and collect optical emissions.
506
Analyze OES data.
508
Generate resulting signal
510
Is the resulting signal within specified limits?
512
YES
NO
Follow Out of Control Action Plan procedures for out of control/specification limits.
514
Further monitoring?
515
YES
NO
END
516

FIG. 5